

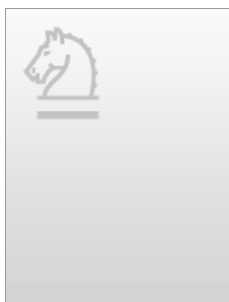
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Ontology, Epistemology, and Teleology for Modeling and Simulation
Intelligent Systems Reference Library Volume 44, 2013, pp 193-206

Modeling and Simulation as a Theory Building Paradigm

Abstract

This chapter makes the case that theory can be captured as a model, which can be implemented as a simulation. This allows composing and recomposing theory components to process new theory out of existing theory. While current modeling and simulation applications focus on simulation as a computational activity that algorithmically produces output data based on valid input data, therefore providing information, the proposed approach utilizes the information and combines the application thereof, which provides knowledge. Relevant work is evaluated, but existing approaches neither use the conceptualization as the central component nor are they applied to ill-defined problems, thus the proposed approach is innovative and closes existing gaps. To show the feasibility and validity, theory is represented as axiomatic structures that can be executed under bounded conditions. As such, the chapter presents a methodological approach for building theory out of existing theory using modeling and simulation.





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About this Chapter

Title	Modeling and Simulation as a Theory Building Paradigm
Book Title	Ontology, Epistemology, and Teleology for Modeling and Simulation
Book Subtitle	Philosophical Foundations for Intelligent M&S Applications
Pages	

pp 193-206

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2013

DOI
10.1007/978-3-642-31140-6_10

Print ISBN
978-3-642-31139-0

Online ISBN
978-3-642-31140-6

Series Title
Intelligent Systems Reference Library

Series Volume
44

Series ISSN
1868-4394

Publisher
Springer Berlin Heidelberg

Copyright Holder
Springer-Verlag Berlin Heidelberg

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